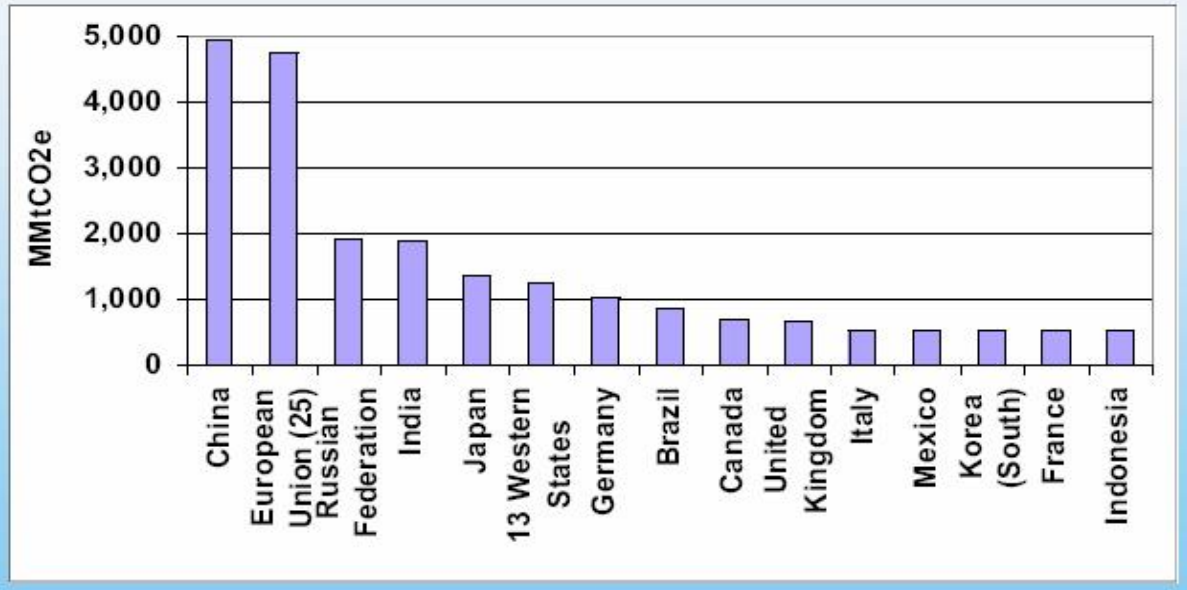
# Utah Green House Gas Inventory

**BRAC**
**on**
**Climate Change**

3/20/07

# Where is the West?

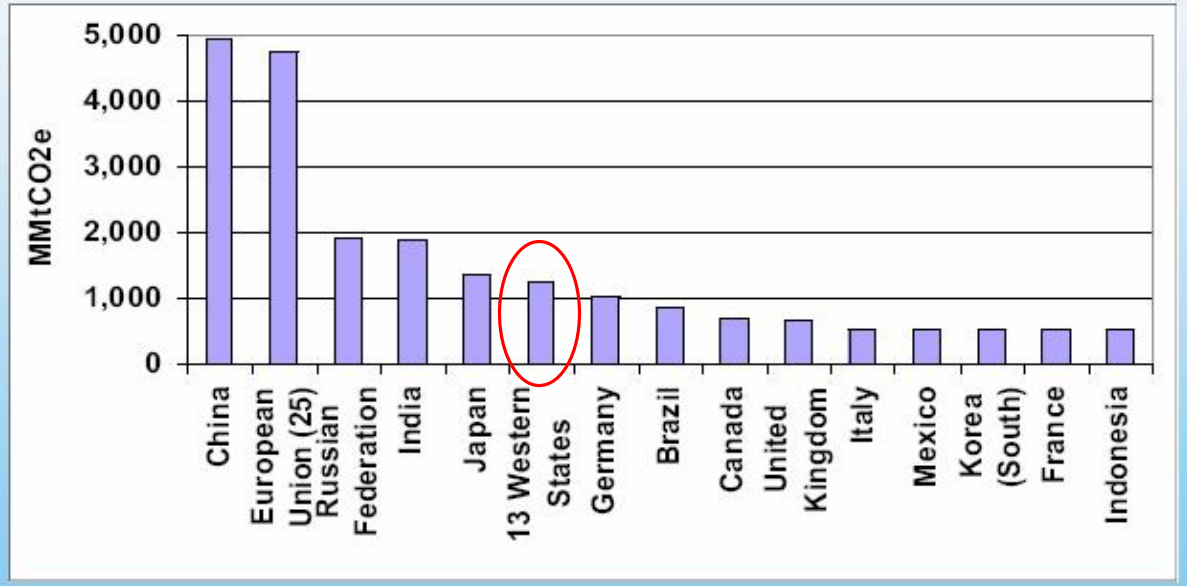
## Ranking of 2000 GHG State and National Emissions



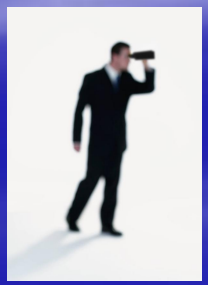



# Where is the West?

## Ranking of 2000 GHG State and National Emissions

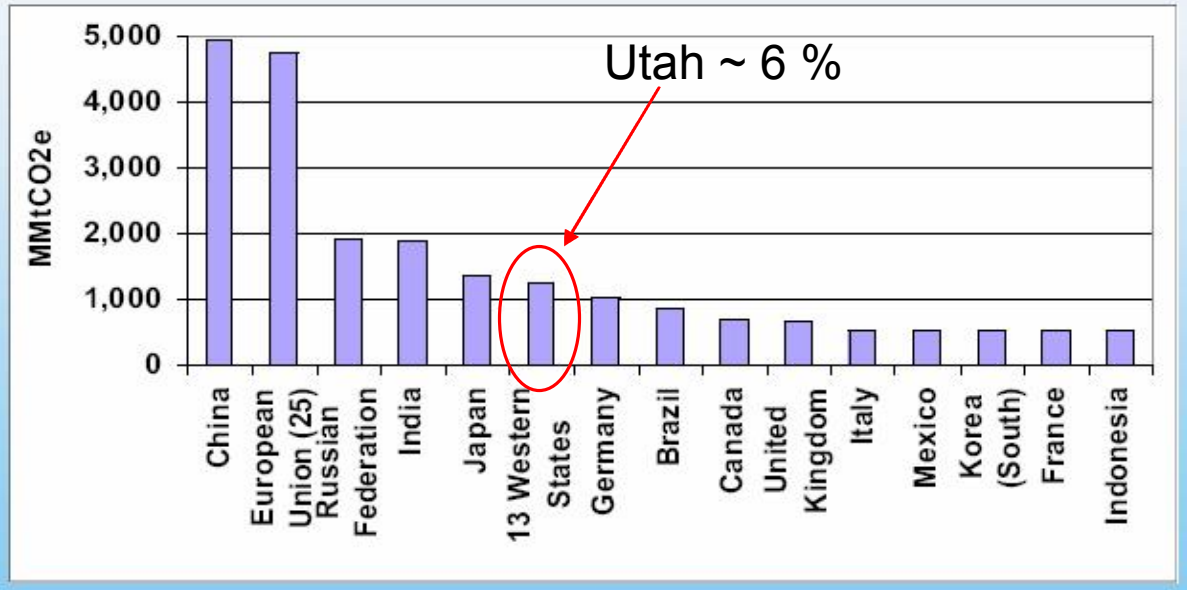




# Where is the West?

## Ranking of 2000 GHG State and National Emissions






# History of Utah's GHG Emissions Inventory

- Utah Department of Environmental Quality (DEQ) GHG Emissions Inventory (EI) for 1990 and 1993

# History of Utah's GHG Emissions Inventory

- Utah Department of Environmental Quality (DEQ) GHG Emissions Inventory (EI) for 1990 and 1993

- Utah Energy Office GHG EI 2000

# History of Utah's GHG Emissions Inventory

- Utah Department of Environmental Quality (DEQ) GHG Emissions Inventory (EI) for 1990 and 1993

- Utah Energy Office GHG EI 2000

- Pechan Report 2007

# Main Points

- Pechan Report consistent with prior Inventory work
  - Consumption based vs. Production based

# Main Points

- Pechan Report consistent with prior Inventory work
  - Consumption based vs. Production based
- Utah's GHG Emissions are growing
  - Electricity and Transportation are the largest sectors

# Main Points

- Pechan Report consistent w/ prior Inventory work
  - Consumption based vs. Production based
- Utah's GHG Emissions are growing
  - Electricity and Transportation are the largest sectors
- Uncertainty

# Approach

- Based on accepted methods using local conditions for all GHG emitting sectors
  - Environmental Protection Agency
  - Intergovernmental Panel on Climate Change

# Approach

- Based on accepted methods using local conditions for all GHG emitting sectors
  - Environmental Protection Agency
  - Intergovernmental Panel on Climate Change
- Calculations made for the 6 standard GHGs
  - Carbon Dioxide (CO2), Methane (CH4), Nitrous Oxide (N20), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulfur Hexafluoride (SF6)

# Approach

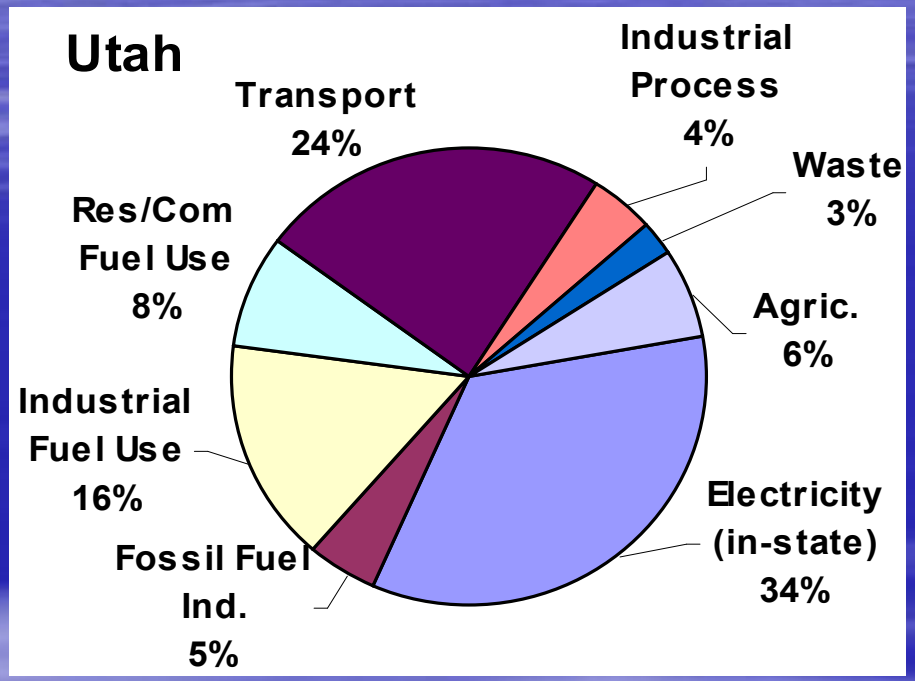
- Covers the period 1990 – 2020
  - 1990-2005 Historical w/ Utah specific data
  - 2006-2020 Projections based on sector estimations

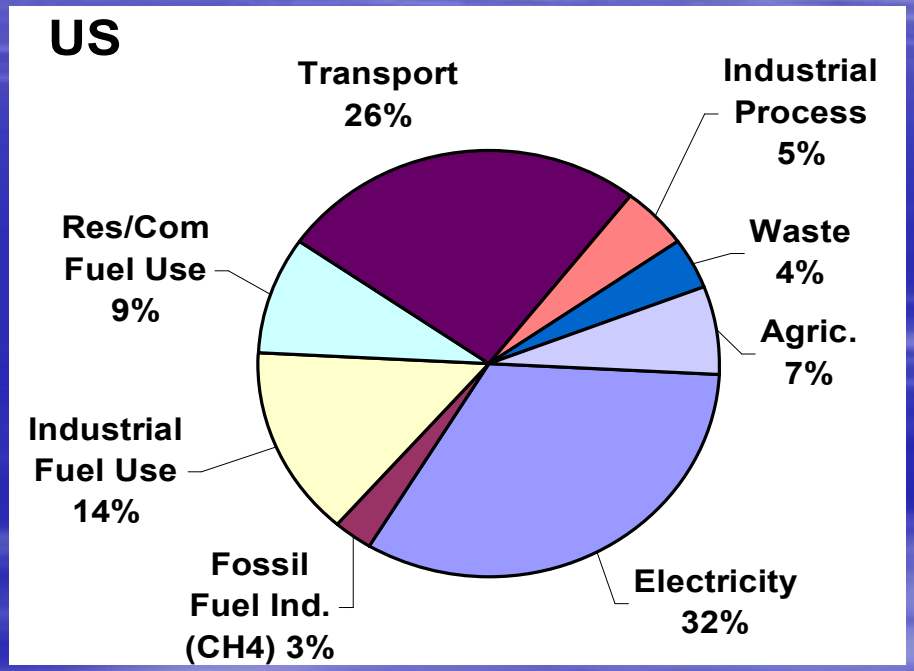
# Approach

- Covers the period 1990 – 2020
  - 1990-2005 Historical w/ Utah specific data
  - 2006-2020 Projections based on sector estimations

- Consumption based rather than production based

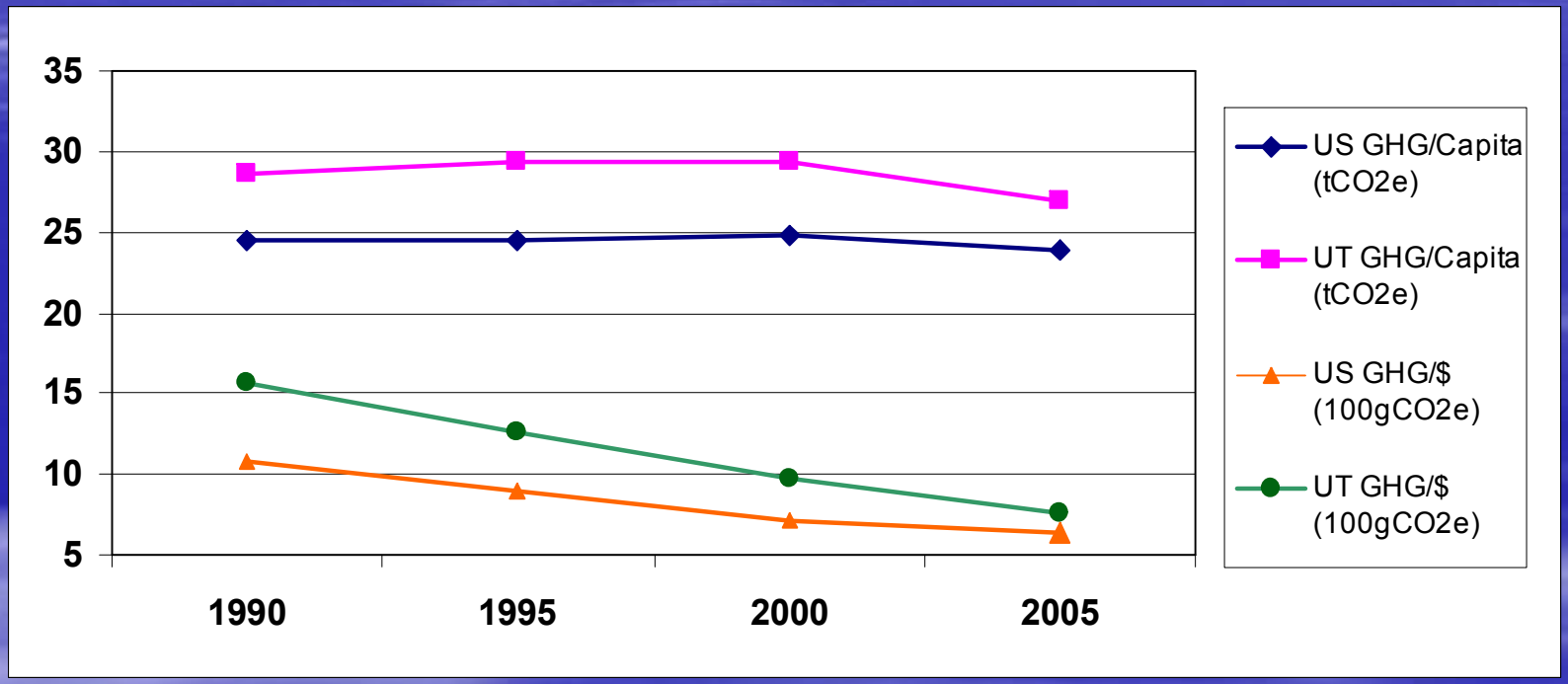
# Utah & US Emissions by Sector Year 2000



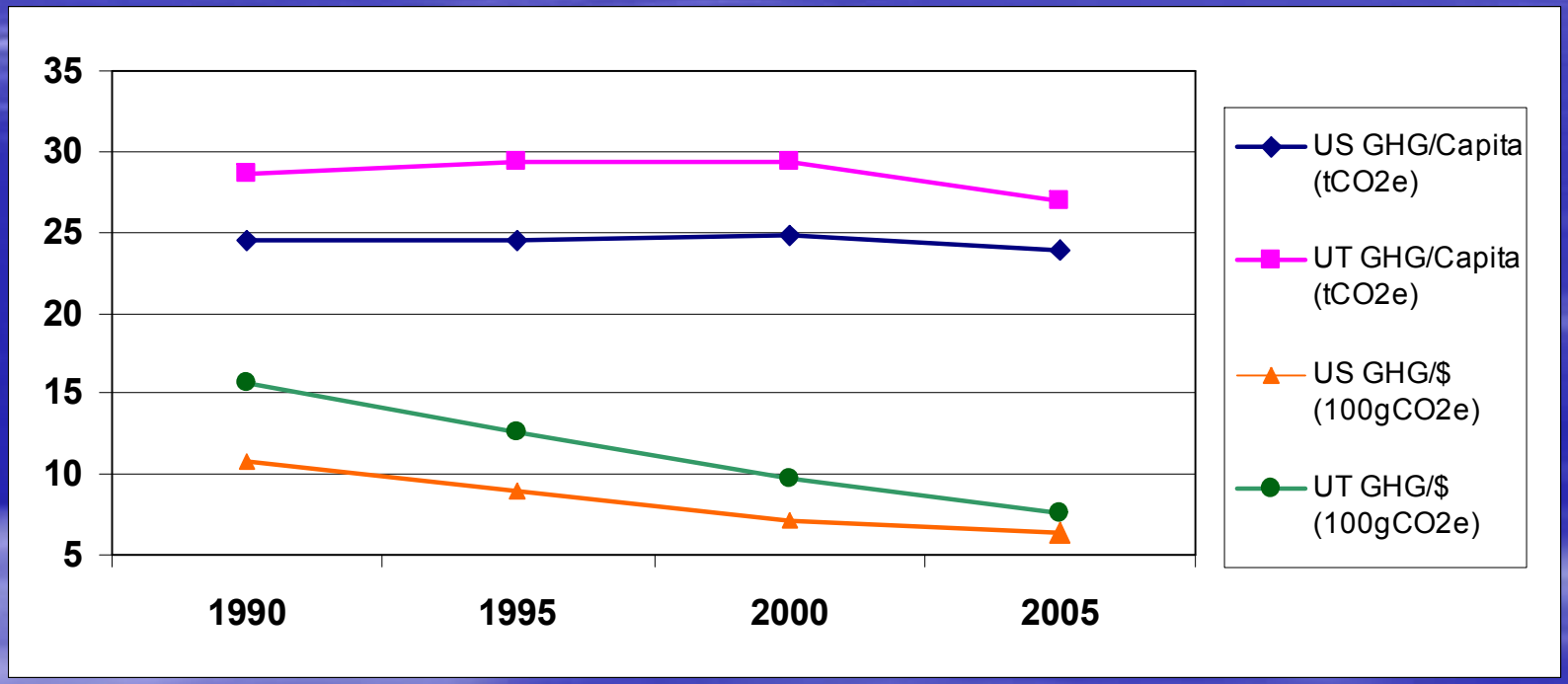




Utah contribution by sector comparable to US average

# Utah and US GHG Emissions: Per Capita and Per Unit Gross Product



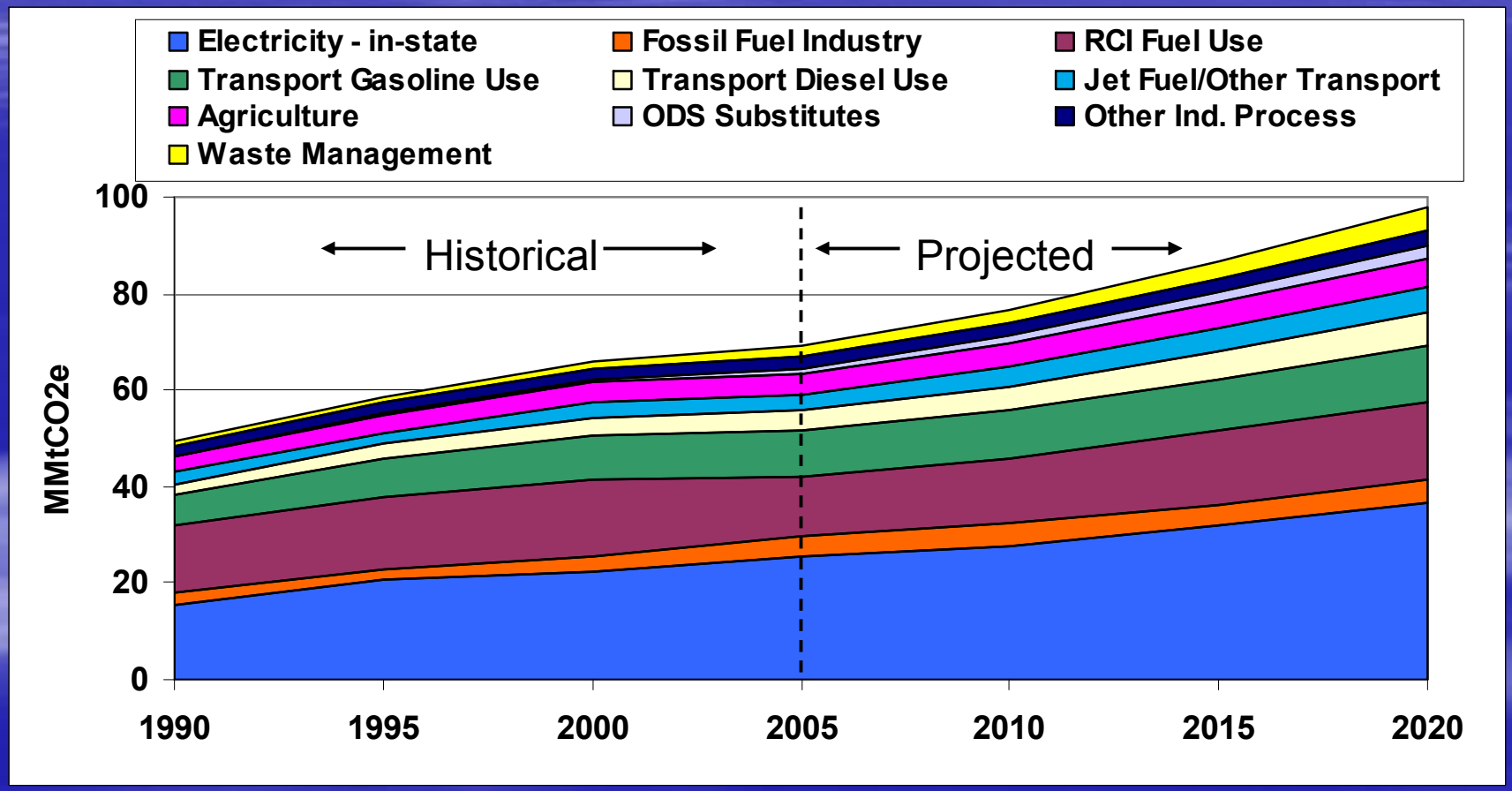
# Utah and US GHG Emissions: Per Capita and Per Unit Gross Product




*Utah's emissions are growing at a faster rate than nation's*

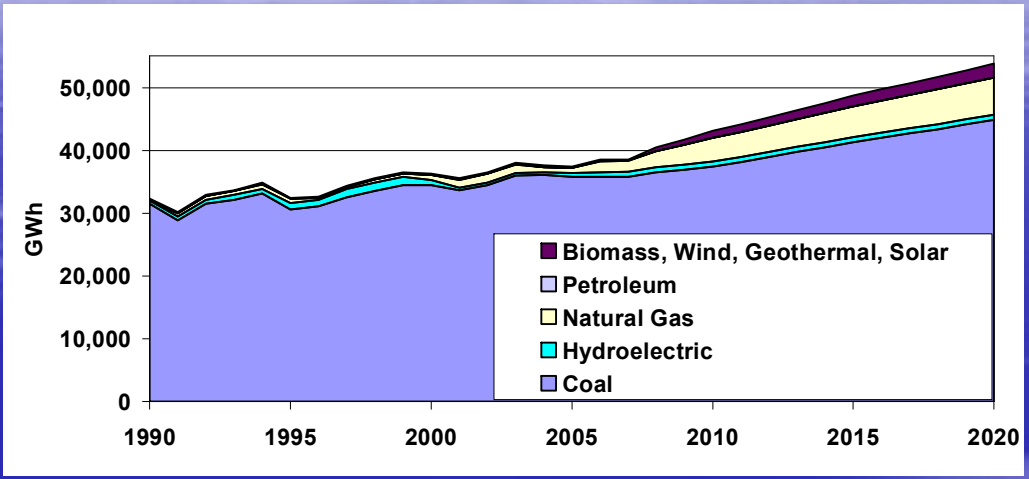
*Utah 40% growth and US 16% growth*

# Utah Gross GHG Emissions by Sector, 1990-2020: Historical and Projected

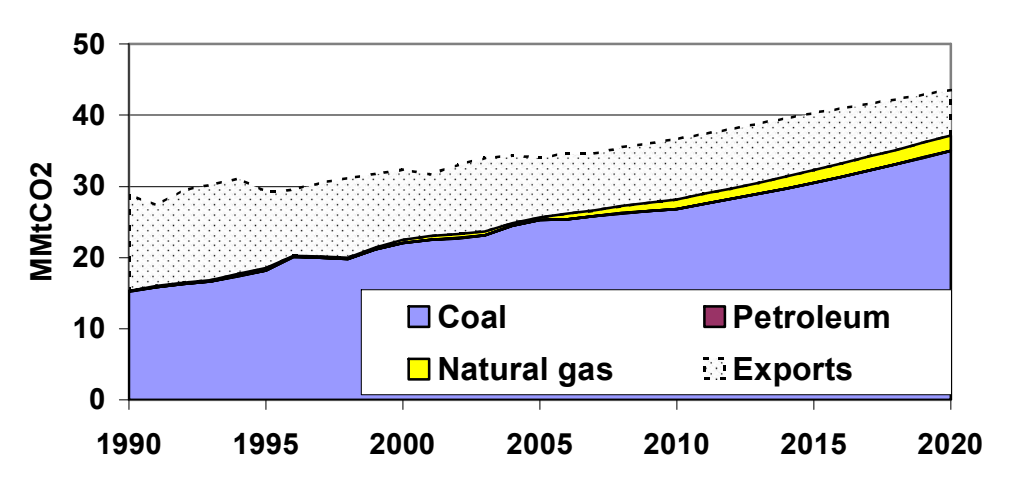


# Electricity Sector

## Electricity Generated by Utah Power Plants 1990-2020

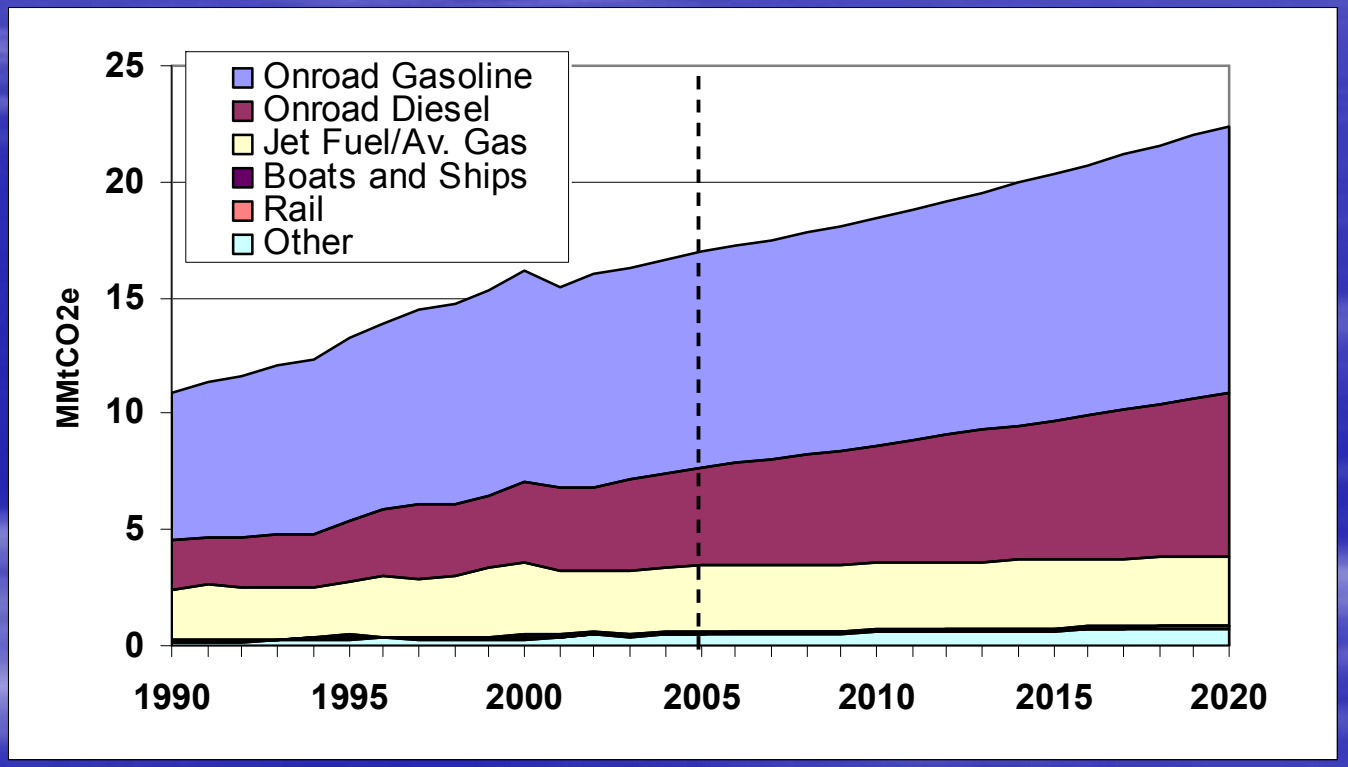



## Utah CO2 Emissions Associated with Electricity Use



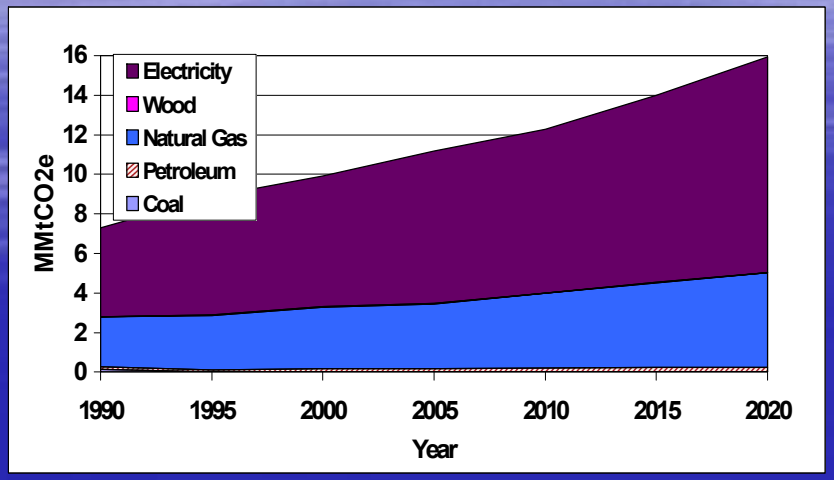
# Transportation Sector

Transportation GHG Emissions by Fuel, 1990-2020

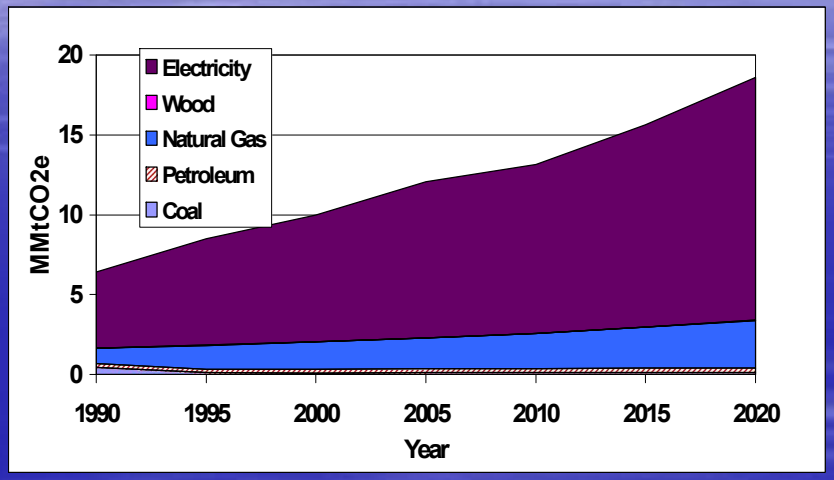


# Residential, Commercial & Industrial

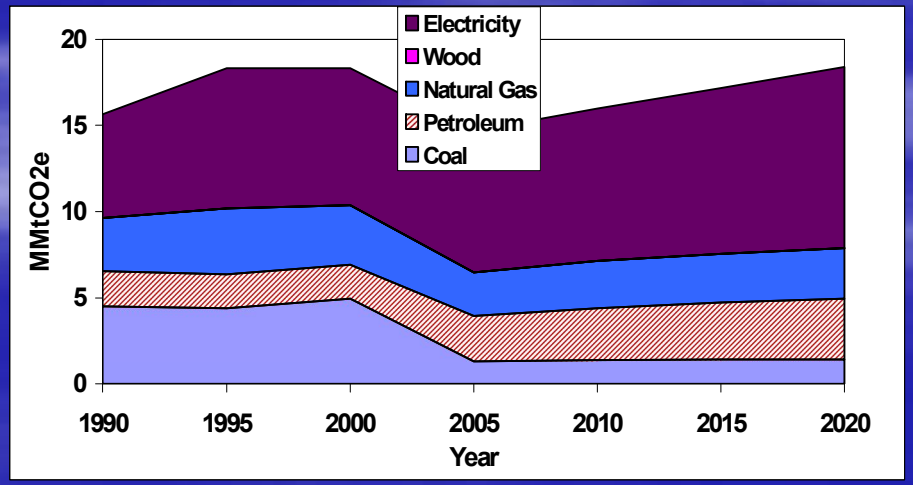
## Residential Sector



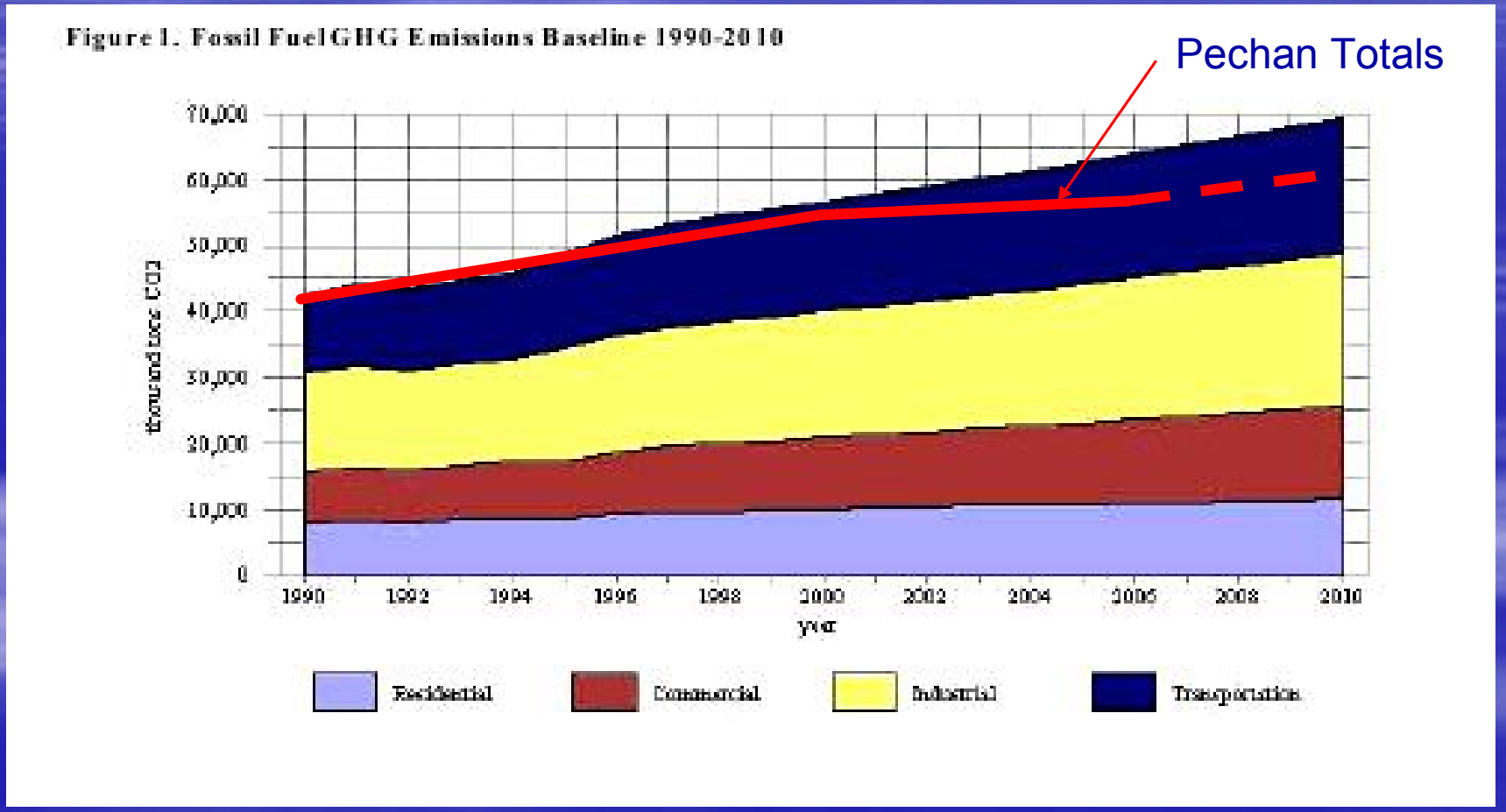

## Commercial Sector




## Industrial Sector



# Pechan Trends are Consistent with 2000 OERP Report



# Forestry Sinks and Black Carbon

Forestry

- 38MMT $CO_2$ sequestered annually in forestlands; significant but highly uncertain
- Considered to be an overestimate due to forest land classification changes by the USFS over time

# Forestry Sinks and Black Carbon

Forestry

- 38MMT $CO_2$ sequestered annually in forestlands; significant but highly uncertain
- Considered to be an overestimate due to forest land classification changes by the USFS over time

Black Carbon

- BC estimated to be 4.9 MMT in 2002
- Highly uncertain $CO_2e$ conversion
- Expect to decline by 2.8 MMT in 2018 due to new engine and fuel standards

# Uncertainties

- Sectors with relatively small emissions were reported with less detail

# Uncertainties

- Sectors with relatively small emissions were reported with less detail
- Emissions factors tend to be better for the larger emission sectors

# Uncertainties

- Sectors with relatively small emissions were reported with less detail
- Emissions factors tend to be better for the larger emission sectors
- Future uncertainty in reference case projections
  - economic, demographic, land use
  - power plant construction
  - transportation – VMT
  - unconventional oil resources not included

# Summary

- Pechan's report provides a high-level overview of the sources of GHG emissions in Utah

# Summary

- Pechan's report provides a high-level overview of the sources of GHG emissions in Utah
- In 2005 37% of Utah's emissions came from electricity use, 25% from transportation, and 18% from RCI combustion

# Summary

- Pechan's report provides a high-level overview of the sources of GHG emissions in Utah
- In 2005 37% of Utah's emissions came from electricity use, 25% from transportation, and 18% from RCI combustion
- Emissions are expected to almost double (50MMT to 98MMT) between 1990 and 2020

# Summary

- Pechan's report provides a high-level overview of the sources of GHG emissions in Utah
- In 2005 37% of Utah's emissions came from electricity use, 25% from transportation, and 18% from RCI combustion
- Emissions are expected to almost double (50MMT to 98MMT) between 1990 and 2020
- Areas of uncertainty, particularly in the projections and smaller sectors

# Summary

- Pechan's report provides a high-level overview of the sources of GHG emissions in Utah
- In 2005 37% of Utah's emissions came from electricity use, 25% from transportation, and 18% from RCI combustion
- Emissions are expected to almost double (50MMT to 98MMT) between 1990 and 2020
- Areas of uncertainty, particularly in the projections and smaller sectors
- However, emissions totals are consistent with totals from prior in-state GHG inventories